

## Claims

1. A method of determining a presence of a chemical species in a mixture of gasses, comprising:
  - 5       introducing the mixture of gasses into a sample cell;
  - irradiating the mixture of gasses in the sample cell with a submillimeter wave that sweeps a predetermined frequency band;
  - generating a submillimeter spectrum of the mixture of gasses;
  - providing a standard submillimeter spectrum of the chemical species that is
  - 10       obtained from the chemical species of a pure form;
  - selecting a first peak of the standard submillimeter spectrum of the chemical species; and
  - determining whether the selected first peak is present in the generated submillimeter spectrum of the mixture of gasses.
  - 15
2. The method of claim 1, further comprising selecting a second peak of the standard submillimeter spectrum of the chemical species when the first peak is present in the submillimeter spectrum, and deciding whether the selected second peak is present in the generated submillimeter spectrum of the mixture of gasses.
- 20
3. The method of claim 1, wherein the first peak is the largest peak in the standard submillimeter spectrum of the mixture of gasses.
4. The method of claim 1, further comprising determining a quantity of the
- 25       chemical species in the mixture of gasses when the first peak is present in the submillimeter spectrum of the mixture of gasses.
5. The method of claim 1, further comprising identifying a component of the mixture of gasses by providing additional standard submillimeter spectra of other
- 30       chemical species and determining the presence of the first peaks of the corresponding

standard submillimeter spectra until at least one of the first peaks is determined to be present in the corresponding spectrum.

6. The method of claim 1, further comprising identifying components of the mixture of gasses by providing additional standard submillimeter spectra of other chemical species and determining the presence of the first peaks of the corresponding standard submillimeter spectra until all of the first peaks of the standard submillimeter spectra provided are determined with respect to the presence in the submillimeter spectra of the mixture of gasses.

10